



ZENworks 2020

Database Management Reference

October 2019

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About This Guide

The information in this guide is organized as follows:

- ♦ [Part I, “Embedded Database Maintenance,” on page 9](#)
- ♦ [Part II, “External Database Maintenance,” on page 47](#)
- ♦ [Part III, “Database Management - Best Practices, Tips, Troubleshooting,” on page 77](#)

Audience

This guide is intended for ZENworks administrators.

Feedback

We want to hear your comments and suggestions about this manual and the other documentation included with this product. Please use the *comment on this topic* link at the bottom of each page of the online documentation.

Additional Documentation

ZENworks is supported by other documentation (in both PDF and HTML formats) that you can use to learn about and implement the product. For additional documentation, see the [ZENworks documentation website](#).

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Embedded Database Maintenance

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1 Retrieving and Storing the Credentials of the Embedded PostgreSQL Database

If you have installed ZENworks with the embedded PostgreSQL database that is bundled with ZENworks, we recommend that you store the credentials of the database for future use.

- 1 Retrieve the credentials of the embedded database by entering one of the following commands at the server prompt:

```
zman database-get-credentials
```

or

```
zman dgc
```

The credentials are displayed on the console.

For more information about zman, view the zman man page (`man zman`) on the server or see “zman(1)” in the [ZENworks Command Line Utilities Reference](#).

- 2 Copy the credentials and save them in a file.

To retrieve and store the credentials of Remote PostgreSQL, Oracle, or Microsoft SQL Server databases, refer to their documentation.

2 Changing the Ports Used by the Embedded PostgreSQL Database

PostgreSQL uses port 5432 by default. However, ZENworks uses 54327 port for PostgreSQL. You can change the port on which the database runs.

- 1 In the `zenworks_database.conf` file, specify the new port number on which the server listens to.

The `zenworks_database.conf` file is located in `%ZENWORKS_HOME%\conf` on Windows and in `/etc/opt/novell/zenworks` on Linux.

- 2 In the `zdm.xml` and `zenaudit.xml` files on all the Primary Servers, specify the new port number in the following entry:

```
<entry key="Port">54327</entry>
```

By default, the entry lists the default port number, 54327.

The `zdm.xml` and `zenaudit.xml` files are located in `%ZENWORKS_HOME%\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux.

- 3 Restart the database service, ZENServer, and ZENLoader services on all Primary servers:

- ♦ **On Windows:**

1. From the Windows desktop Start menu, click **Settings > Control Panel**.
2. Double-click **Administrative Tools > Services**.
3. Restart the following services: **Novell ZENworks Embedded Datastore**, **Novell ZENworks Loader Service**, and **Novell ZENworks Server**.

- ♦ **On Linux:** At the console prompt, enter the following commands in the order given:

On SLES 11:

- ♦ `/etc/init.d/novell-zenmntr stop`
- ♦ `/etc/init.d/novell-zenserver stop`
- ♦ `/etc/init.d/novell-zenloader stop`
- ♦ `/etc/init.d/zenpostgresql restart`
- ♦ `/etc/init.d/novell-zenserver start`
- ♦ `/etc/init.d/novell-zenloader start`
- ♦ `/etc/init.d/novell-zenmntr start`

On SLES 12:

- ♦ `systemctl stop novell-zenserver.service`
- ♦ `systemctl stop novell-zenloader.service`
- ♦ `systemctl restart zenpostgresql`

- ♦ `systemctl start novell-zenserver.service`
- ♦ `systemctl start novell-zenloader.service`

3 Configuring PostgreSQL

Each Primary Server on PostgreSQL can consume up to 300 database connections. If you want to add more than one Primary Server, you should change the property values in the `postgresql.conf` file.

For the embedded database, the `postgresql.conf` file is available at the following location:

- ♦ **On Windows:** `ZENworks\database\pgsql\data\postgresql.conf`
- ♦ **On Linux:** `/vastorage/var/opt/novell/pgsql/data`

Use the following formula to calculate the property values.

`max_connections` = Number of primary servers * 300

`max_prepared_transactions` = Number of primary servers * 300

After changing the property values in `postgresql.conf`, restart the ZENworks and PostgreSQL service.

To restart the PostgreSQL service:

- ♦ **On Windows:** To start the service, perform the following:
 1. Press Windows + R keys.
 2. Type `services.msc`.
 3. Search for the **Novell ZENworks Embedded Datastore - PostgreSQL** service.
 4. Right-click the option and then select Restart.
- ♦ **On Linux:** To start the service, run the `systemctl restart zenpostgresql.service` command.

4 Migrating the OEM PostgreSQL Database to an External PostgreSQL Database

If you are using the OEM PostgreSQL database in ZENworks 2017 Update x, then ensure that you migrate to an external PostgreSQL database before upgrading your zone to ZENworks 2020.

Using the database migration script, you can migrate the database. The script file can be downloaded from the following locations:

[Download the OEM PostgreSQL to External PostgreSQL Migration script](#)

Depending on the platform, you can download the script file, and then perform the following steps to migrate to an external PostgreSQL database:

- ♦ [“On Linux” on page 17](#)
- ♦ [“On Windows” on page 18](#)

On Linux

1. Take a backup of the database.
2. Stop all services in ZENworks Primary Server.
3. On the database server, download and extract the `migrate_postgres.sh.zip` file.
4. Download and install the PostgreSQL version supported by ZENworks.

If you are planning to upgrade to ZENworks 2020, ensure that you install PostgreSQL 11.4.

5. Change the permission for the script by running the `chmod 755 migrate_script.sh` command.
6. The script log will be saved in the `/tmp/migrate_postgres.log` location.
7. Run the following script:

```
./migrate_postgres.sh -p <PostgreSQL_Installed_Directory> --database  
<zenworks_db_name> --password <superuser password>
```

Example: `./migrate_postgres.sh -p /usr/pgsql-11/ --database
zenworks_database --password novell`

NOTE

- ♦ To see all the available options, run the script without any argument. (Example: `./migrate_postgres.sh`)
 - ♦ After migrating to the external PostgreSQL, ensure that you manually clean the OEM PostgreSQL installation.
-

On Windows

1. Stop all services in ZENworks Primary Server.
2. On the database server, download and extract the `migrate_postgres.bat.zip` file.
3. Download and install the PostgreSQL version supported by ZENworks.
If you are planning to upgrade to ZENworks 2020, ensure that you install PostgreSQL 11.4.
4. Open the command prompt as an administrator.
The PostgreSQL upgrade log will be generated in the current directory.
Hence, it is recommended to change the directory to `%USERPROFILE%` so that PostgreSQL has permission to write logs.
5. Copy the batch file in the current directory.
6. The output will be saved at the `%TEMP%\migrate_postgres.log` location.
7. Run the following command to migrate the database. Specify the database superuser password when prompted:

```
migrate_postgres.bat -p "<postgresql_install_location">
```


Example: `migrate_postgres.bat -p C:\Program Files\PostgreSQL\11`

NOTE

- ♦ To see all the available options, run the script without any argument (Example: `./migrate_postgres.bat`).
 - ♦ After migrating to the external PostgreSQL, ensure that you manually clean the OEM PostgreSQL installation.
-

5 Migrating the Data from an Internal Sybase Database to an External PostgreSQL Database

ZENworks 2020 onwards, the Sybase database will no longer be supported, and the Sybase data will have to be migrated to any ZENworks supported database. Using the new Database Migration tool, you can migrate the Sybase database to the PostgreSQL database. For more information, see [Database Migration from Sybase to PostgreSQL](#).

The migration tool can be downloaded from the ZENworks 2020 downloads in the Micro Focus Customer Center.

NOTE: Ensure that you download the latest version of the database migration tool.

6 Moving the Data from an Embedded PostgreSQL Database to an External PostgreSQL Database

ZENworks allows you move the data from an embedded PostgreSQL to an external PostgreSQL database:

- ♦ [“Preparing to Move the Data” on page 21](#)
- ♦ [“Important Commands and Locations” on page 21](#)
- ♦ [“Moving the Data from an Embedded PostgreSQL to an External PostgreSQL” on page 22](#)

Preparing to Move the Data

Before moving the data from an embedded PostgreSQL database to an external PostgreSQL database, perform the following:

- ♦ Ensure that ZENworks is installed with an embedded PostgreSQL database on a Windows or Linux device.
- ♦ Install the external PostgreSQL database. For more information on how to install an external PostgreSQL database, see [Installing PostgreSQL](#) in the [Database Migration from Sybase to PostgreSQL](#).

Important Commands and Locations

This section provides some of the command and locations that will be used quite frequently while moving the data. Ensure that you keep the following information handy while initiating the data migration:

- ♦ The ZENworks database and Audit database names on the embedded PostgreSQL database are available in `zdm.xml` and `zenaudit.xml` files. These files are available in the following location:

Check the **Database** key to get the database name.

On Windows: `%ZENWORKS_HOME%\conf\datamodel\`

On Linux: `/etc/opt/novell/zenworks/datamodel/`

Example:

```
<entry key="Database">zenworks</entry>
```

```
<entry key="Database">zenworksaudit</entry>
```

- ♦ The database details can be retrieved by running the following commands:
 - ♦ `zman dgc`: Retrieves the database credentials used to connect to the embedded database.
 - ♦ `zman dgca`: Retrieves the database credentials used to connect to the audit embedded database.
 - ♦ `zman dgcs`: Retrieves the database credentials of super user that is used to connect to the embedded database.
 - ♦ **IMPORTANT:** The user that should be used in the following steps (unless explicitly mentioned) should be any user (administrator) who has privileges to control and monitor ZENworks services.
-

Moving the Data from an Embedded PostgreSQL to an External PostgreSQL

Moving the data from an embedded PostgreSQL server to an external PostgreSQL server is a two step process:

- ♦ [“Step 1: Backup the Database on the Embedded Primary Server” on page 22](#)
- ♦ [“Step 2: Restore the Database on an External Server” on page 24](#)

Step 1: Backup the Database on the Embedded Primary Server

1. Before executing the following steps, ensure that you have reviewed the information documented in the section [Important Commands and Locations](#).
2. Stop the ZENworks Services on all the Primary Servers by running the following configure action:

```
novell-zenworks-configure -c Start
```

After running the command, under Action, select Stop.
3. On the Primary Server on which the Embedded Database is installed, Start the **Novell ZENworks Embedded Datastore** service using the following steps:
On Windows: Press the **Win + R** keys on the keyboard to open the Run window. Type *services.msc* and then hit Enter.
Start the *Novell ZENworks Embedded Datastore – PostgreSQL* service.
On Linux: Run the following command to start the Novell ZENworks Embedded Datastore – PostgreSQL service.
 - ♦ **On SLES 12 and later:** `systemctl start zenpostgresql.service`
 - ♦ **On SLES 11:** `/etc/init.d/zenpostgresql start`
4. Login to the Primary Server that has the database role.
5. Initiate the backup by setting the following variables:
 - ♦ PGPORT: <existing source DB port configured>
By default, ZENworks uses 54327
 - ♦ PGDATA: <embedded_database_location>

- ♦ PGUSER: <existing super user for ZENworks postgres DB> The default user for ZENworks is zenpostgres.
- ♦ PGDATABASE: <existing database name> ZENworks default is postgres
- ♦ PGPASSWORD: <password for the above super user PGUSER>

Example 6-1 Example for Windows Primary Server

Set the following environment variables:

- ♦ Set the PATH for PostgreSQL installation.
- ♦ Set the PATH for PostgreSQL bin folder.

Open the command prompt and set the following variables based on the existing configuration.

- ♦ SET PGPORT=54327
- ♦ SET PGDATA=%ZENWORKS_HOME%\database\pgsql\data
- ♦ SET PGUSER=<super user retrieved from zman dgcs>
- ♦ SET PGDATABASE=postgres
- ♦ SET PGPASSWORD=<password retrieved from zman dgcs>;

Example 6-2 Example for Linux Primary Server:

Open the terminal and set the following variables based on the existing configuration.

- ♦ export LD_LIBRARY_PATH=/opt/novell/zenworks/share/pgsql/lib;
- ♦ export PATH=\$PATH:/opt/novell/zenworks/share/pgsql/bin;
- ♦ export PGPORT=54327;
- ♦ export PGDATA=/var/opt/novell/pgsql/data;
- ♦ export PGUSER=<super user retrieved from zman dgcs>;
- ♦ export PGDATABASE=postgres;
- ♦ export PGPASSWORD=<password retrieved from zman dgcs>;

6. Run the following commands to back up both the databases (ZENworks and Audit):

♦ **On Windows:**

- ♦ cd "%ZENWORKS_HOME%\share\postgres\bin\"
- ♦ pg_dumpall.exe > "<path to sql file>"
Example: pg_dumpall.exe > c:\postgres_dump.sql

♦ **On Linux:**

- ♦ cd /opt/novell/zenworks/share/pgsql/bin/
- ♦ ./pg_dumpall > "<path to sql file>"
Example: ./pg_dumpall > /tmp/postgres_dump.sql

7. On the Primary Server on which the Embedded Database is installed (source database), Stop the **Novell ZENworks Embedded Datastore** service using the following steps:

On Windows: Press the **Win + R** keys on the keyboard to open the Run window. Type *services.msc* and then hit Enter.

Stop the *Novell ZENworks Embedded Datastore – PostgreSQL* service.

On Linux: Run the following command to start the Novell ZENworks Embedded Datastore – PostgreSQL service.

- ♦ **On SLES 12:** `systemctl stop zenpostgresql.service`
- ♦ **On other SLES versions:** `/etc/init.d/zenpostgresql stop`

Step 2: Restore the Database on an External Server

Perform the following steps on an external server on which you want to move the PostgreSQL database. After installing PostgreSQL on an external server, ensure that the PostgreSQL database service is running.

To restore the database on an external database server, perform the following steps:

1. Set the following environment variables:

- ♦ PGPORT: <target DB port>
- ♦ PGUSER: <target super user for postgres DB>
- ♦ PGDATABASE: <target initial connection database name> default is postgres
- ♦ PGPASSWORD: <password for the above super user i.e. PGUSER>

Example 6-3 Example for Windows Primary Server

Set the following environment variables:

- ♦ Set the path for PostgreSQL installation.
- ♦ Set the path for PostgreSQL bin folder.

Open the command prompt and set the following variables based on the existing configuration.

- ♦ SET PGPORT=54327
- ♦ SET PGUSER=<PostgreSQL super user>
- ♦ SET PGDATABASE=postgres
- ♦ SET PGPASSWORD=<Postgres super user password>

Example 6-4 Example for Linux Primary Server:

Open the terminal and set the following variables based on the existing configuration.

- ♦ `export LD_LIBRARY_PATH=<postgres installation path>/lib;`
- ♦ `export PATH=$PATH:<postgres installation path>/bin;`
- ♦ `export PGPORT=<Port on which PostgreSQL is configured>;`
- ♦ `export PGUSER=<Postgres super user>;`
- ♦ `export PGDATABASE=postgres;`
- ♦ `export PGPASSWORD=<PostgreSQL super user password>;`

2. Login as PostgreSQL super user and manually create the database using the following query for the databases that should be restored:

```
create database <DB name> with template=template0 encoding='UTF8';
```


For example:

- ♦ **ZENworks Database:** create database zenworks with template=template0 encoding='UTF8';
- ♦ **Audit Database:** create database zenworksaudit with template=template0 encoding='UTF8';

NOTE: Names of the databases that are being created should exactly match (considering case) with the source database names.

The source database names can be retrieved from the zdm.xml and zenaudit.xml files in the source database server. For more information on the file location, see [“Important Commands and Locations” on page 21](#).

3. Copy the postgres_dump.sql file that was created in [Step 1: Backup the Database on the Embedded Primary Server](#) to the target device.
4. Restore the database from the backup taken in [Step 1: Backup the Database on the Embedded Primary Server](#), by running the following commands:

- ♦ **On Windows:** In the Command prompt, run the following commands:

- ♦ cd <postgres installation path>\bin
- ♦ psql.exe -v ON_ERROR_STOP=0 -f c:\postgres_dump.sql -o c:\postgres_dump_log.txt -L c:\postgres_dump_log.log > c:\postgres_dump_log.err 2>&1

- ♦ **On Linux:** In the Terminal, run the following commands as PostgreSQL user:

- ♦ cd <postgres installation path>/bin
- ♦ ./psql -v ON_ERROR_STOP=0 -f /tmp/postgres_dump.sql -o /tmp/postgres_dump_log.txt -L /tmp/postgres_dump_log.log > /tmp/postgres_dump_log.err 2>&1

5. After Restoring the database, log into the ZENworks database, and run the below query to delete the database role for the device that has the embedded PostgreSQL database installed by running the following query on the external database server:

```
delete from zZenServerRoles where Roles = 'Database';
commit;
```

6. Update the following changes in zdm.xml and zenaudit.xml for all the Primary Servers in the zone:

- ♦ Delete the <entry key="Embedded">true</entry>.
- ♦ Update the value of the Port key with the port on which the external PostgreSQL database is configured.

```
<entry key="Port"><PORT-of-target-DB-device></entry>
```

7. Update the server key value in the zdm.xml and zenaudit.xml files as shown below:

- ♦ In the target database server, add the loopback IP address.

```
<entry key="Server">127.0.0.1</entry>
```
- ♦ In all the other Primary Server, add the IP of the target database server.

```
<entry key="Server"><target_database_server-IP></entry>
```

8. After updating the changes, restart all the ZENworks services by running the `novell-zenworks-configure -c Start` configure action.
9. Ensure that the **Novell ZENworks Embedded Datastore** service is disabled and not running on the Primary Server that hosted the Embedded PostgreSQL database.
10. The ZENworks Server now points to new database.
Ensure that you can successfully log into ZCC. After logging into ZCC, go to the Diagnostics page and in the ZENworks Databases panel, verify the Host IP addresses and also verify that the Audit database is connected.

7 Moving an Embedded PostgreSQL Database from One Primary Server to another Primary Server

ZENworks enables you to move the embedded database from one Primary Server to another Primary Server or Appliance. Perform the steps provided in the following section to move the database from one Primary Server to another Primary Server.

- ♦ [“Important Commands and Locations” on page 27](#)
- ♦ [“Moving an Embedded PostgreSQL Database from One Primary Server to another Primary Server” on page 28](#)

Important Commands and Locations

This section provides some of the command and locations that will be used quite frequently while moving the data. Ensure that you keep the following information handy while initiating the data migration:

- ♦ The ZENworks database and Audit database names on the embedded PostgreSQL database are available in `zdm.xml` and `zenaudit.xml` files. These files are available in the following location:

Check the **Database** key to get the database name.

On Windows:

```
%ZENWORKS_HOME%\conf\datamodel\
```

On Linux / Appliance:

```
/etc/opt/novell/zenworks/datamodel/
```

Example:

```
<entry key="Database">zenworks</entry>
```

```
<entry key="Database">zenworksaudit</entry>
```

- ♦ The database details can be retrieved by running the following commands:
 - ♦ `zman dgc`: Retrieves the database credentials used to connect to the embedded database.
 - ♦ `zman dgca`: Retrieves the database credentials used to connect to the audit embedded database.
 - ♦ `zman dgcs`: Retrieves the database credentials of super user that is used to connect to the embedded database.

-
- ♦ **IMPORTANT:** The user that should be used in the following steps (unless explicitly mentioned) should be any user (administrator) who has privileges to control and monitor ZENworks services.
-
- ♦ To connect to the database, see [Connecting to the Embedded PostgreSQL Database](#).

Moving an Embedded PostgreSQL Database from One Primary Server to another Primary Server

Moving the data is a two step process:

- ♦ “[Step 1: Backup the Database on the Embedded Primary Server \(PSDB1\)](#)” on page 28
- ♦ “[Step 2: Restoring the Database](#)” on page 30

IMPORTANT: While moving the database, we refer the source database server as PSDB1 and the destination database server as PSDB2.

Step 1: Backup the Database on the Embedded Primary Server (PSDB1)

1. Before executing the following steps, ensure that you have reviewed the information documented in the section [Important Commands and Locations](#).
2. Stop the ZENworks Services on all the Primary Servers by running the following configure action:

```
novell-zenworks-configure -c Stop
```

After running the command, under Action, select Stop.
3. On the Primary Server on which the Embedded Database is installed (PSDB1), start the **Novell ZENworks Embedded Datastore** service using the following steps:
On Windows: Press the **Win + R** keys on the keyboard to open the Run window. Type *services.msc* and then hit Enter.
Start the *Novell ZENworks Embedded Datastore – PostgreSQL* service.
On Linux: Run the following command to start the Novell ZENworks Embedded Datastore – PostgreSQL service.
 - ♦ **On SLES 12 and later:** `systemctl start zenpostgresql.service`
 - ♦ **On SLES 11:** `/etc/init.d/zenpostgresql start`
4. Login to the Primary Server that has the database role.
5. Initiate the backup by setting the following variables:
 - ♦ **PGPORT:** <existing source DB port configured>
By default, ZENworks uses 54327
 - ♦ **PGDATA:** <embedded_database_location>
 - ♦ **PGUSER:** <existing super user for ZENworks postgres DB> The default user for ZENworks is zenpostgres.

- ♦ PGDATABASE: <existing database name> ZENworks default is postgres
- ♦ PGPASSWORD: <password for the above super user PGUSER>

Example 7-1 Example for Windows Primary Server

Open the command prompt and set the following variables based on the existing configuration.

- ♦ SET PGPORT=54327
- ♦ SET PGDATA=<install_directory>\PostgreSQL\<version>\data
- ♦ SET PGUSER=<super user retrieved from zman dgcs>
- ♦ SET PGDATABASE=postgres
- ♦ SET PGPASSWORD=<password retrieved from zman dgcs>;

Example 7-2 Example for Linux Primary Server:

Open the terminal and set the following variables based on the existing configuration.

- ♦ export LD_LIBRARY_PATH=/opt/novell/zenworks/share/pgsql/lib;
- ♦ export PATH=\$PATH:/opt/novell/zenworks/share/pgsql/bin;
- ♦ export PGPORT=54327;
- ♦ export PGDATA=/var/opt/novell/pgsql/data;
- ♦ export PGUSER=<super user retrieved from zman dgcs>;
- ♦ export PGDATABASE=postgres;
- ♦ export PGPASSWORD=<password retrieved from zman dgcs>;

6. Run the following commands to back up both the databases (ZENworks and Audit):

♦ **On Windows:**

- ♦ cd "%ZENWORKS_HOME%\share\postgres\bin\"
 - ♦ pg_dumpall.exe > "<path to sql file>"
- Example: pg_dumpall.exe > c:\postgres_dump.sql

♦ **On Linux:**

- ♦ cd /opt/novell/zenworks/share/pgsql/bin/
 - ♦ ./pg_dumpall > "<path to sql file>"
- Example: ./pg_dumpall > /tmp/postgres_dump.sql

7. On the Primary Server on which the Embedded Database is installed, Stop the **Novell ZENworks Embedded Datastore** service using the following steps:

On Windows: Press the **Win + R** keys on the keyboard to open the Run window. Type *services.msc* and then hit Enter.

Stop the *Novell ZENworks Embedded Datastore – PostgreSQL* service.

On Linux: Run the following command to start the Novell ZENworks Embedded Datastore – PostgreSQL service.

- ♦ **On SLES 12 and later:** systemctl stop zenpostgresql.service
- ♦ **On SLES 11:** /etc/init.d/zenpostgresql stop

8. Copy the postgres_dump.sql file to the target Primary Server.

Step 2: Restoring the Database

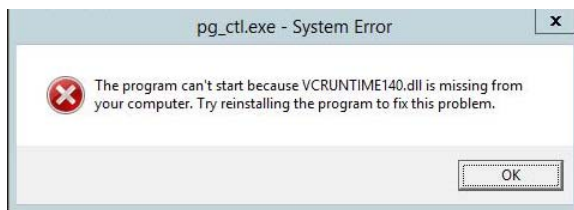
Depending on the target database platform, refer to the following section to restore the database:

- ♦ [“Restore the Database on a Windows Primary Server \(PSDB2\)” on page 30](#)
- ♦ [“Restore the Database on a Linux Primary Server or Appliance Server \(PSDB2\)” on page 34](#)

Restore the Database on a Windows Primary Server (PSDB2)

If you are planning to restore the database on a Windows server, then perform the following steps:

NOTE: While restoring the database, if the following error is displayed, then install the `vc_redist.x64.exe` and try again.



The `vc_redist.x64.exe` file is available in the following location:

`<zenworks_mount_directory>: \Common\include`

- 1 Install PostgreSQL by running the following command:

```
msiexec /i <postgresql_MSI_FILE> TARGETDIR="%ZENWORKS_HOME%\share"
ALLUSERS=2
```

For example:

```
msiexec /i "%ZENWORKS_HOME%\install\downloads\msi\novell-zenworks-
postgres-11.4.x86_64.msi" TARGETDIR="%ZENWORKS_HOME%\share" ALLUSERS=2
```

- 2 After installing the PostgreSQL, if the database folder is not available, create the folder as shown below folder structure, and ensure that you give write permission to the folder:

```
%ZENWORKS_HOME%\database\pgsql\data
```

To provide write permissions, perform the following steps:

1. In Windows Explorer, right-click a file or folder and select Properties.
2. In the Properties window, click the Security tab.
3. In Group or user names, select a user, and then click Edit.
4. Select Allow for the Write permission and then click OK or Apply.

- 3 Open the command prompt, and then set the following environment variables:

- ♦ PGDATA: `<embedded_database_location>`
- ♦ PGPORT: `<existing source DB port configured>` ZENworks default is 54327
- ♦ PGDATABASE: `<existing database name>` ZENworks default is postgres

- 4 Go to `%ZENWORKS_HOME%\share\postgres\bin`, and then run the `pg_ctl.exe initdb` command.

- 5 In PSDB2, edit the `pg_hba.conf` and `postgresql.conf` files as shown below:

The `pg_hba.conf` and `postgresql.conf` files are available in the following location:

`%ZENWORKS_HOME%\database\pgsql\data`

On Linux:

`/etc/opt/novell/zenworks/datamodel/`

- ◆ In the `pg_hba.conf` file, update the content as shown below:

```
# TYPE DATABASE USER ADDRESS METHOD
# IPv4 local connections:
host all all 127.0.0.1/32 trust
# IPv6 local connections:
host all all ::1/128 trust
# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all trust
host replication all 127.0.0.1/32 trust
host replication all ::1/128 trust
host all all 0.0.0.0/0 trust
host all all ::0/0 trust
```

- ◆ In the `postgresql.conf` file, uncomment the `listen_addresses` and `Port` entry keys and update the values as shown below:

```
listen_addresses = '*'
```

```
Port= 54327
```

- 6 Restart the server.

- 7 After restarting the server, open the command prompt, go to

`%ZENWORKS_HOME%\share\postgres\bin`, and then set the following environment variables:

```
SET PGDATA=%ZENWORKS_HOME%\database\pgsql\data
```

```
SET PGPORT=54327
```

```
SET PGDATABASE=postgres
```

NOTE: Since the device was restarted, you need to set these environment variables again.

- 8 Run the `pg_ctl.exe start` command.

- 9 To connect to the destination database server (PSDB2), run the `psql.exe postgres` command. By default, `postgres` is the database name.

In the same window, you will be logged into the PostgreSQL database.

The get the database details, see [“Important Commands and Locations” on page 27](#).

- 10 Run the following command:

```
create user zenpostgres with password '<password that was obtained
using zman dgcs>';
```

Example:

```
create user zenpostgres with password 'Zw0#dd5352592267b601daa85cb39';
```

- 11 Create the database for ZENworks and Audit databases, by running the following command:

```
create database <DB name> with template=template0 encoding='UTF8';
```

For Example:

ZENworks Database:

```
create database zenworks with template=template0 encoding='UTF8';
```

Audit Database:

```
create database zenworksaudit with template=template0 encoding='UTF8';
```

If you have enabled Antimalware, then run the following:

NOTE

- ♦ Names of the databases that are being created should exactly match (considering case) with the source database names.
 - ♦ The source database names can be retrieved from the zdm.xml and zenaudit.xml files in the source database server. For more information on the file location, see [“Important Commands and Locations” on page 27](#)
-

12 Quit psql.

To quit psql, you use \q command and press enter to exit psql.

13 Restore the database by running the following command:

```
psql.exe -v ON_ERROR_STOP=0 -f <dump_location> -o <log_location> -L  
<log_location> > <error_log_location> 2>&1
```

- ♦ -f <filename>: Uses the file filename as the source of SQL commands.
- ♦ -L <filename>: Writes all query output into the file, in addition to the normal output destination.
- ♦ -o <filename>: Logs all query output into the file.
- ♦ All the errors will be redirected to <error_log_location>.

For Example:

```
psql.exe -v ON_ERROR_STOP=0 -f c:\tmp\postgres_dump.sql -o  
c:\tmp\postgres_log.txt -L c:\tmp\postgres_log.log  
>c:\postgres\postgres_log.err 2>&1
```

NOTE: The database was already created in Step 11 of the Restore process. Hence, ERROR about invalid locale should be ignored.

14 In the destination database server (PSDB2), change the server key in zdm.xml and zenaudit.xml and , available in the following location with the local host address 127.0.0.1:

%ZENWORKS_HOME%\conf\datamodel

Example: <entry key="Server">127.0.0.1</entry>

15 In all the other Primary Server (except destination database server (PSDB2)), update the value of the server key with the IP address of the new database server in zdm.xml and zenaudit.xml.

<entry key="Server"><IP-of-PSDB2></entry>

Example: <entry key="Server">10.1.1.2</entry>

16 On the destination database server (PSDB2), create the database service by running the following command:


```
%ZENWORKS_HOME%\share\postgres\bin\pg_ctl.exe" register -N "Novell
ZENworks Embedded Datastore - PostgreSQL" -U LocalSystem -D
"%ZENWORKS_HOME%\database\pgsql\data" -S auto
```

- 17 Set the description of the service by running the following command:

```
sc description "Novell ZENworks Embedded Datastore - PostgreSQL"
"Embedded datastore used for storing ZENworks objects and resources."
```

- 18 Go to the "%ZENWORKS_HOME%\share\postgres\bin\" location and run the pg_ctl.exe stop command.

- 19 In PSDB2, update the pg_hba.conf file, and the file should be similar to as shown below:

```
# "local" is for Unix domain socket connections only
local all all trust
# IPv4 local connections:
host all all 127.0.0.1/32 trust
# IPv6 local connections:
host all all ::1/128 trust
# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all trust
host replication all 127.0.0.1/32 trust
host replication all ::1/128 trust
host all all 0.0.0.0/0 trust
host all all ::0/0 trust
```

Now, you will be able to log into PostgreSQL using the psql.exe -W postgres, with the password that was obtained by running the zman dgcs command.

- 20 Start the Novell ZENworks Embedded Datastore service by performing the following steps:

- ◆ Press **Win + R** shortcut keys on the keyboard. In the Run dialogue, type *services.msc*, and then click **OK**.
- ◆ Select the Novell ZENworks Embedded Datastore - PostgreSQL service and then click **Start**.

- 21 Start the ZENworks services by running the novell-zenworks-configure -c Start command.

- 22 Start the ZENworks services on the PSDB1 server by running the novell-zenworks-configure -c Start command.

NOTE: Ensure that the Novell ZENworks Embedded Datastore service is not running anymore on the source database server (PSDB1) device. You can either rename the service file, or unregister or remove the PSDB1 server.

To disable the service, perform the following steps:

1. Press Windows + R keys
2. Type services.msc.
3. Search for the Novell ZENworks Embedded Datastore - PostgreSQL service.
4. Right-click the option and then select Properties.
5. In the Startup type drop-down, select Disabled, and then click OK.

After disabling, the service will not start after the system restart.

- 23** Assign the database role to PSDB2 by running the query command in the pgadmin or any other client that can connect to PostgreSQL database server:

```
update zZenServerRoles set id='\x<PSDB2_GUID>', position=(select
max(position)+1 from zZENServerRoles where id='\x<PSDB2_GUID>') where
Roles='Database'
commit;
```

Example:

```
update zZenServerRoles set id='\xB66A9EA0D88A53B0801C07D5B44A5FE9',
position=(select max(position)+1 from zZENServerRoles where
id='\xB66A9EA0D88A53B0801C07D5B44A5FE9') where Roles='Database';
```

- 24** The ZENworks Server now points to new database.

Ensure that you can successfully log into ZCC. After logging into ZCC, go to the Diagnostics page and in the ZENworks Databases panel, verify the Host IP addresses and also verify that the Audit database is connected.

Restore the Database on a Linux Primary Server or Appliance Server (PSDB2)

On a Linux Primary Server or an Appliance Server, perform the following steps:

- 1** Install PostgreSQL by performing the following steps:

On Appliance, perform the steps as a root user.

- ♦ Open the terminal in the following path:

```
/opt/novell/zenworks/install/downloads/rpm
```

- ♦ Run `rpm -Uvh <Postgre_RPM_File>`

For example,

```
rpm -Uvh novell-zenworks-postgresql-11.4-1.x86_64.rpm
```

- 2** Set the following environment variables:

- ♦ **PGPORT**:<target DB port>
- ♦ **PGDATA**:<database_path>
- ♦ **PGDATABASE**:<target initial connection database name> preferable is postgres

NOTE

- ♦ For setting the environment variables and running the database commands, ensure that you switch to the zenpostgres user (`su zenpostgres`).
 - ♦ It is recommended that you run the database commands in one terminal and other operations such as file edit (`pg_hba.conf` and `postgresql.conf`) in another terminal.
-

Example 7-3 Open the terminal prompt and set the following variables based on the existing configuration.

- ♦ `export LD_LIBRARY_PATH=/opt/novell/zenworks/share/pgsql/lib;`
- ♦ `export PATH=$PATH:/opt/novell/zenworks/share/pgsql/bin;`
- ♦ `export PGPORT=54327;`

- ♦ export PGDATA=/var/opt/novell/pgsql/data;
- ♦ export PGDATABASE=postgres;

After setting the variables, open terminal in the following location perform the next steps:

/opt/novell/zenworks/share/pgsql/bin

3 Run the `./pg_ctl initdb` command.

4 Edit the `pg_hba.conf` and `postgresql.conf` files as shown below:

The `pg_hba.conf` and `postgresql.conf` files are available in the following location:

/var/opt/novell/pgsql/data

- ♦ In the `pg_hba.conf` file, update the content as shown below:

```
# TYPE DATABASE USER ADDRESS METHOD
# "local" is for Unix domain socket connections only
local all all trust
# IPv4 local connections:
host all all 127.0.0.1/32 trust
# IPv6 local connections:
host all all ::1/128 trust
# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all trust
host replication all 127.0.0.1/32 trust
host replication all ::1/128 trust
host all all 0.0.0.0/0 trust
host all all ::0/0 trust
```

- ♦ In the `postgresql.conf` file, uncomment the `listen_addresses` and `Port` entry keys and update the values as shown below:

```
listen_addresses = '*'
```

```
Port= 54327
```

5 Open command prompt, and go to `/opt/novell/zenworks/share/pgsql/bin`, and then run the `./pg_ctl start` command.

6 To log into the database, run `./psql -w postgres`. By default, `postgres` is the database name.

7 After login, run the `ALTER USER zenpostgres with PASSWORD '<zenpostgres_password>';` command.

Example:

```
ALTER USER zenpostgres with PASSWORD 'Zw0#ff511c5b77e3fe97a4337431b';
```

8 Manually create the database using the following query:

```
create database <DB name> with template=template0 encoding='UTF8';
```

For Example:

ZENworks Database:

```
create database zenworks with template=template0 encoding='UTF8';
```

Audit Database:

```
create database zenworksaudit with template=template0 encoding='UTF8';
```

NOTE

- ♦ Names of the databases that are being created should exactly match (considering case) with the source database names.
 - ♦ The source database names can be retrieved from the `zdm.xml` and `zenaudit.xml` files in the source database server. For more information on the file location, see [“Important Commands and Locations” on page 27](#).
-

9 Ensure that the PostgreSQL user has access to the dump being imported.

10 Quit `psql`.

To quit `psql`, you use `\q` command and press enter to exit `psql`.

11 Go to the `/opt/novell/zenworks/share/pgsql/bin` location and then run the following command to restore the database as PostgreSQL user:

```
./psql -v ON_ERROR_STOP=0 -f <dump_location> -o <log_location> -L  
<log_location> > <error_log_location> 2>&1
```

- ♦ `-f <filename>`: Uses the file filename as the source of SQL commands.
- ♦ `-L <filename>`: Writes all query output into the file, in addition to the normal output destination.
- ♦ `-o <filename>`: Logs all query output into the file.
- ♦ All the errors will be redirected to `<error_log_location>`.

For example:

```
./psql -v ON_ERROR_STOP=0 -f /tmp/postgres_dump.sql -o /tmp/  
postgres_log.txt -L /tmp/postgres_log.log > /tmp/postgres_log.err 2>&1
```

NOTE: The database was already created in Step 8 of the Restore process. Hence, ERROR about invalid locale should be ignored.

12 In the destination database server (PSDB2), change the server key in `zdm.xml` and `zenaudit.xml` available in the following location with the localhost address 127.0.0.1:

```
/etc/opt/novell/zenworks/datamodel
```

Example: `<entry key="Server">127.0.0.1</entry>`

13 In all the other Primary Server (except destination database server (PSDB2)), update the value of the server key with the IP address of the destination database server in `zdm.xml` and `zenaudit.xml`.

```
<entry key="Server"><PSDB2_IP></entry>
```

Example: `<entry key="Server">10.1.1.2</entry>`

14 Start ZENworks services on the destination database server (PSDB2) by running the `novell-zenworks-configure -c Start` command.

NOTE: Ensure that the Novell ZENworks Embedded Datastore service is disabled and not running on the source database server (PSDB1). You can either rename the service file, or unregister or remove the PSDB1 server.

To disable the service, run the following command:

- ♦ **On SLES 11:** `chkconfig zenpostgresql off`
- ♦ **On SLES 12 and later:** `systemctl disable zenpostgresql.service`

After disabling, the service will not start after the system restart.

- 15** On all the Primary Servers, restart the ZENworks services by running the following command:

```
novell-zenworks-configure -c Start
```

- 16** Assign the database role to destination database server (PSDB2) by running the query command in the pgadmin or any other client that can connect to PostgreSQL database server:

```
update zZenServerRoles set id='\x<PSDB2_GUID>', position=(select
max(position)+1 from zZENServerRoles where id='\x<PSDB2_GUID>') where
Roles='Database'
commit;
```

Example:

```
update zZenServerRoles set id='\xB66A9EA0D88A53B0801C07D5B44A5FE9',
position=(select max(position)+1 from zZENServerRoles where
id='\xB66A9EA0D88A53B0801C07D5B44A5FE9') where Roles='Database';
```

- 17** The ZENworks Server now points to new database.

Ensure that you can successfully log into ZCC. After logging into ZCC, go to the Diagnostics page and in the ZENworks Databases panel, verify the Host IP addresses and also verify that the Audit database is connected.

- 18** Go to /opt/novell/zenworks/share/pgsql/bin and run the ./pg_ctl stop command.

- 19** In the PSDB2, edit the pg_hba.conf file, and the file should be similar to as shown below:

```
# "local" is for Unix domain socket connections only
local  all             all                                trust
# IPv4 local connections:
host   all             all                                127.0.0.1/32      trust
# IPv6 local connections:
host   all             all                                ::1/128          trust
# Allow replication connections from localhost, by a user with the
# replication privilege.
local  replication     all                                trust
host   replication     all                                127.0.0.1/32      trust
host   replication     all                                ::1/128          trust
host   all             all                                0.0.0.0/0         trust
host   all             all                                ::0/0            trust
```

Now, you will be able to log into PostgreSQL using the ./psql -W postgres, with the password that was obtained by running the zman dgcs command.

8 Migrating an OEM Sybase database from one Primary Server to a PostgreSQL database in an another Primary Server

To migrate an OEM Sybase database from one Primary Server to a PostgreSQL database in an another Primary Server, perform the following steps:

1. Move the OEM Sybase database from one Primary Server to another Primary Server. For more information, see [Moving the Internal Sybase Database from One Primary Server to Another Primary Server](#).
2. Use the database migration tool to migrate to the PostgreSQL database. For more information, see [Database Migration from Sybase to PostgreSQL](#).

9 Backing Up and Restoring the PostgreSQL Database

- ♦ “Backing Up the PostgreSQL Database” on page 41
- ♦ “Using the zman command to Take a Backup of the Database” on page 42
- ♦ “Using the pg_dump Command to Take a Backup of the Database” on page 42
- ♦ “Restoring the PostgreSQL Database” on page 43

Backing Up the PostgreSQL Database

By default, ZENworks automatically backs up the PostgreSQL database every week. By using the AutomaticPostgreSQLBackupConfigureAction, you can schedule the automatic backup of the database. By default, the database backup schedule is set to Sunday midnight. However, you can use the pgsqlDBbackupConf.xml file to customize the backup schedule.

NOTE: The AutomaticPostgreSQLBackupConfigureAction takes backup only the Embedded PostgreSQL database.

After successfully running the configure action, the backup (PGDUMP) is saved in the following location:

- ♦ **On Windows:** %ZENWORKS_HOME%\work\pgsql
- ♦ **On Linux:** /var/opt/novell/zenworks/

Based on requirements, you can customize the pgsqlDBbackupConf.xml file and then run the novellmicrofocus-zenworks-configure -c AutomaticPostgreSQLBackupConfigureAction command.

The pgsqlDBbackupConf.xml file is located in the following location:

- ♦ **On Windows:** %ZENWORKS_HOME%\conf\pgsql
- ♦ **On Linux:** /etc/opt/novell/zenworks/pgsql

NOTE: By default, only ZENworks database is backed up. If required, you can enable the backup of audit database by setting the AuditEnabled parameter to true in the pgsqlDBbackupConf.xml file.

Following is an example of the pgsqlDBbackupConf.xml file:

```

<Schedule>
  <DailySchedule>
    <DaysOfWeek>
      <Sunday>true</Sunday>
      <Monday>false</Monday>
      <Tuesday>false</Tuesday>
      <Wednesday>false</Wednesday>
      <Thursday>false</Thursday>
      <Friday>false</Friday>
      <Saturday>false</Saturday>
    </DaysOfWeek>
    <StartTime Hour="23" Minute="55" Second="0" />
  </DailySchedule>
</Schedule>
<ns2:BackupDir>C:\Program Files (x86)\Novell\ZENworks\work</
ns2:BackupDir>
  <ns2:AuditEnabled>false</ns2:AuditEnabled>
  <ns2:ZenEnabled>true</ns2:ZenEnabled>
</ns2:BackupConfig>

```

Using the zman command to Take a Backup of the Database

To back up an embedded database, run the `zman db <backup_directory>` command on the server that has the database role.

NOTE: Ensure that the backup directory is already created.

Example: `zman db c:\pg_dbbackup`

In this example, `pg_dbbackup` should be created in the C drive.

Using the pg_dump Command to Take a Backup of the Database

You can use the PostgreSQL `pg_dump` command to do a full online backup of both Embedded and External database.

Before executing the PostgreSQL `pg_dump` command, ensure that you update the `LD_LIBRARY_PATH` variable as shown below:

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/novell/zenworks/share/pgsql/lib
```

For more information, see [pg_dump \(https://www.postgresql.org/docs/11/backup-dump.html\)](https://www.postgresql.org/docs/11/backup-dump.html).

Restoring the PostgreSQL Database

Restoring an archived database is performed by using the `pg_restore` command. Using the `pg_restore` command, you can restore the backup taken by both `pg_dump` and `AutomaticPostgreSQLBackupConfigureAction`.

To restore a backup, use the following command:

```
pg_restore [connection-option...] [option...] [filename]
```

For more information on options, see [pg_restore \(https://www.postgresql.org/docs/11/app-pgrestore.html\)](https://www.postgresql.org/docs/11/app-pgrestore.html).

Restoring the Database Backup Taken Using the ZMAN Command

To restore a backup that was taken using the `zman` command (`zman db`), perform the following:

On Linux

1. Stop the services using the following commands:
 - ♦ `systemctl stop novell-zenserver.service`
 - ♦ `systemctl stop novell-zenloader.service`
2. (conditional) If Vertica is enabled in your zone, then stop the following services in ZENworks Appliance, using following command:
 - ♦ `systemctl stop zenworks-connect.service`
 - ♦ `systemctl stop zenworks-kafka.service`
3. Close the database dangling connections by running the following commands:

```
SELECT pg_terminate_backend(pid)
FROM pg_stat_activity
WHERE pid = pg_backend_pid
```
4. Change the user by running the `su zenpostgres` command.
5. Set the super user password for `pg_restore` and `dropdb` using the following command:

```
$ PGPASSWORD=<<set_superuser_password>>; export PGPASSWORD
```
6. Set the library path and BIN path as shown below:
 - ♦ `LD_LIBRARY_PATH=/opt/novell/zenworks/share/pgsql/lib; export LD_LIBRARY_PATH`
 - ♦ `PATH=$PATH:/opt/novell/zenworks/share/pgsql/bin; export PATH`
7. Drop the existing database, the database name can be `zenworks` or `audit` database.

```
$ dropdb --host=localhost --port=54327 --username=<<superuser_name>>
<<database_name>>
```

8. Restore the database by running the following command:

```
$ pg_restore --host=localhost --port=54327 --  
username=<<superuser_name>> --format=directory --  
dbname=<<database_name>> -C -c <<full path to zenDB_pg_dump>>
```

NOTE: Ensure that the dump directory is accessible from zenpostgres or postgres user.

On Windows

1. Stop the following services using the Windows Services MSI:
 - ♦ novell-zenserver.service
 - ♦ novell-zenloader.service
2. (conditional) If Vertica is enabled in your zone, then stop the following services in ZENworks Appliance:
 - ♦ zenworks-connect.service
 - ♦ zenworks-kafka.service
3. Close the database dangling connections by running the following commands from PSQL:
 - ♦ SELECT pg_terminate_backend(pid)
 - ♦ FROM pg_stat_activity
 - ♦ WHERE pid = pg_backend_pid
4. Set the super user password for the pg_restore and dropdb commands:

```
set PGPASSWORD=<<set superuser password>>
```
5. Change the command line to the PostgreSQL bin folder path as shown below:

```
cd /vastorage/opt/novell/zenworks/share/pgsql/bin/
```
6. Drop the existing database by running the following command. The database name can be zenworks or audit database.

```
dropdb --host=localhost --port=54327 --username=<<superuser_name>>  
<<database_name>>
```
7. Restore the database by running the following command:

```
pg_restore --host=localhost --port=54327 --username=<<superuser_name>>  
--format=directory --dbname=<<database_name>> -C -c <<full path to  
zenDB_pg_dump>>
```

NOTE: Ensure that the dump directory is accessible from zenpostgres or postgres user.

10 Connecting to the Embedded PostgreSQL Database

To connect to the embedded PostgreSQL database, based on the existing configurations, set the following environment variables:

NOTE

1. The parameter values are available in the `zdm.xml` file.

The `zdm.xml` file is available in the following location:

- ♦ **On Windows** %ZENWORKS_HOME%\conf\datamodel
 - ♦ **On Linux / Appliance** /etc/opt/novell/zenworks/datamodel
2. Use the `zman dgc` commands to get the user name and password. For more information, see [ZENworks Command Line Utilities Reference](#).
-

On Linux / Appliance Open the terminal and set the following parameters:

- ♦ `su zenpostgres`
- ♦ `LD_LIBRARY_PATH=/opt/novell/zenworks/share/pgsql/lib; export LD_LIBRARY_PATH`
- ♦ `PATH=$PATH:/opt/novell/zenworks/share/pgsql/bin; export PATH`
- ♦ `PGPORT=<port_number>; export PGPORT`
- ♦ `PGUSER=<user_name>; export PGUSER`
- ♦ `PGDATABASE=<database_name>; export PGDATABASE`
- ♦ `PGPASSWORD=<password>; export PGPASSWORD`
- ♦ `cd /vastorage/opt/novell/zenworks/share/pgsql/bin/`
- ♦ `./psql`

On Windows Open command prompt and set the following parameters:

- ♦ `set PGPASSWORD=<password>`
- ♦ `set PGUSER=<user_name>`
- ♦ `set PGDATABASE=<database_name>`
- ♦ `set PGPORT=<port_number>`
- ♦ `cd C:\Program Files (x86)\Novell\ZENworks\share\postgres\bin`
- ♦ `psql`



External Database Maintenance

- ♦ Chapter 11, “Migrating the Data from the MS SQL Database to an Oracle Database,” on page 49
- ♦ Chapter 12, “Configuring the ZENworks Server to Point to the New MS SQL Database Containing Data Moved from Another MS SQL Database,” on page 55
- ♦ Chapter 13, “Configuring the ZENworks Server to Point to the New Oracle Database Containing Data Moved from Another Oracle Database,” on page 59
- ♦ Chapter 14, “Configuring PostgreSQL,” on page 61
- ♦ Chapter 15, “Creating External PostgreSQL Database Schema,” on page 63
- ♦ Chapter 16, “Migrating the Data from an External Sybase Database to an External PostgreSQL Database,” on page 65
- ♦ Chapter 17, “Migrating the Data from an Oracle Database to an MS SQL Database,” on page 67
- ♦ Chapter 18, “Backing Up and Restoring the PostgreSQL Database,” on page 73
- ♦ Chapter 19, “Migrating from md5 to scram authentication in PostgreSQL,” on page 75

11 Migrating the Data from the MS SQL Database to an Oracle Database

ZENworks allows you migrate the data from the MS SQL database to an Oracle database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- ♦ [“Preparing to Move the Data” on page 49](#)
- ♦ [“Migrating the Data from the MS SQL Database to an Oracle Database” on page 51](#)
- ♦ [“Post-Migration Tasks” on page 53](#)

Preparing to Move the Data

Before migrating the data from the MS SQL database to Oracle database, do the following:

- ♦ Run the ZENworks Diagnostic Center (ZDC) and check for schema differences.

If the ZENworks database tables are not present under the default database schema DBO, then to avoid any issues, contact Micro Focus Customer Center before upgrading your zone.

To find out the database scheme, run the following query in the Microsoft SQL database:

```
SELECT distinct(SCHEMA_NAME(schema_id)) as OWNER FROM sys.objects WHERE  
type= 'U'
```

IMPORTANT: If the unique constraint is not created on the serial number column of the zDevice table, database migration from the Microsoft SQL database to the Oracle database might fail.

- ♦ Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- ♦ Ensure that the Oracle database is installed on a device that does not have ZENworks installed.
- ♦ Ensure that the "USERS"/USER-CREATED tablespace has sufficient space to create and store the ZENworks database schema. The tablespace requires a minimum of 100 MB to create ZENworks database schema without any data in it and an appropriate additional space depending upon the size of the database to be migrated. For more information on tablespaces, refer to the section [“Prerequisites for Oracle”](#) in *ZENworks Server Installation*.
- ♦ Ensure that the NLS_CHARACTERSET parameter is set to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16 by running the following query at the database prompt:

```
select parameter, value from nls_database_parameters where parameter  
like '%CHARACTERSET%';
```

- ♦ Ensure that the **sharename**, **filename**, and **path columns** do not contain blank strings in the NC_VRBSOFTWARE table.

- ♦ (Conditional) If you want to migrate the database by creating a new user schema, ensure that the following additional requirements are met:
 - ♦ You must be aware of the database administrator credentials.

NOTE: Ensure that the database administrator has the following privileges:

- ♦ GRANT ALL on DBMS_REDEFINITION with GRANT option;
 - ♦ GRANT ALL on DBMS_DDL with GRANT option;
-

- ♦ A tablespace must already exist for associating to the Oracle access user
- ♦ You can choose to migrate the database by using an existing user schema that resides on a server in your network in the following scenario:
 - ♦ The database administrator create two user schemas with the necessary rights and you get the credentials for both user schemas from the database administrator. In this case, the database administrator credentials are not required to migrate the database.

If you want to migrate the database by using an existing user schema, ensure that the following additional requirements are met:

- ♦ Ensure that the user schemas must have the following rights to create the database.

```
CREATE_SESSION
CREATE_TABLE
CREATE_VIEW
CREATE_PROCEDURE
CREATE_SEQUENCE
CREATE_TRIGGER
DBMS_REDEFINITION
DBMS_DDL
DBMS_LOCK
```

- ♦ Ensure that the quota for the user schemas is set to Unlimited for the tablespaces to be used.
- ♦ Manually stop the ZENworks services running on all the ZENworks Servers in the Management Zone.
 - ♦ **On Windows:**
 1. Execute the following command at the server prompt:


```
novell-zenworks-configure -c Start
```
 2. Enter the number next to the Stop action.
 - ♦ **On Linux:**
 1. Execute the following command at the server prompt:


```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```
 2. Enter the number next to the Stop action.

- Ensure that your external MS SQL database service is running.
- (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:

1. Set the value of `Logger.logLevel` to the appropriate message type.

For example, if you want messages of the type Finest to be logged:

```
#Logger.logLevel    = FINEST
```

2. Uncomment the line by removing the “#” as follows:

```
Logger.logLevel    = FINEST
```

The `novell-zenworks-configure.properties` file is located in

`%ZENWORKS_HOME%\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

IMPORTANT: For better performance depending on the database size and available resource, you can increase the batchsize in the `db-migration-mssql-to-oracle.properties` file. It is located in `%ZENWORKS_HOME%\novell\zenworks\conf\` on Windows and in `/etc/opt/novell/zenworks/conf/` on Linux.

Migrating the Data from the MS SQL Database to an Oracle Database

- [“Migrating the Data from the MS SQL Database to an Oracle Database” on page 51](#)
- [“Resuming the Database Migration” on page 52](#)

Migrating the Data from the MS SQL Database to an Oracle Database

- 1 Ensure that all the tasks listed in [“Preparing to Move the Data” on page 49](#) are completed.
- 2 Run the database migration utility. .
- 3 Enter the target database type as Oracle.
- 4 Enter the IP address or host name of the Oracle database server.
- 5 Enter the port used by the Oracle database server.
- 6 Enter the fully qualified net service name for the Oracle database.
- 7 You can choose to create a new user schema or use an existing user schema.
If you choose to create a new schema, continue with [Step 8](#).
If you choose to use an existing user schema, skip to [Step 9](#).
- 8 Enter the database server administrator's user name and password.
- 9 Enter the schema name when prompted for the database user name.
- 10 Enter the database schema password when prompted for the database user's password.

NOTE: The migration utility prompts for inputs as mentioned in [Step 4](#) to [Step 9](#) to migrate audit database as well.

The database migration starts.

- 11 When the database migration is complete, you can check the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in `%ZENWORKS_HOME%\log\` on Windows and in `/var/opt/novell/log/zenworks/` on Linux.
- 12 After the database is successfully migrated, continue with the following steps:
 - 12a Perform post-migration tasks. .
 - 12b Re-configure the ZENworks Reporting Server to point to the Oracle database, because it will still be pointing to the MS SQL database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the `dbmigration.xml` file has been created. The file is located in the `ZENworks_installtion_path\bin` directory on Windows, and in the `/opt/novell/zenworks/bin` directory on Linux.

- 1 Run the database migration utility. .
- 2 Enter the target database type as Oracle.
- 3 Enter the IP address or host name of the Oracle database server.

You must specify the IP address or host name of the Oracle database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.
- 4 Enter the port used by the Oracle database server.
- 5 Enter the fully qualified net service name for the Oracle database.
- 6 Choose to use an existing schema.
- 7 Enter the schema name when prompted for the database user name specified before stopping the database migration.
- 8 Enter the database schema password when prompted for the database user's password specified before stopping the database migration.

NOTE: The migration utility prompts for inputs as mentioned in [Step 3](#) to [Step 8](#) to migrate audit database as well.

- 9 Choose to resume the database migration.

The database migration starts.

- 10 After the database is successfully migrated, continue with [“Post-Migration Tasks”](#) on page 53.

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an Oracle database.

If there are multiple servers in the Management Zone:

- 1 From the device where you ran the migration utility, copy the following files and paste them in the appropriate directory, on all other Primary Servers:

```
zdm.xml
dmaccounts.properties
dmmappings.properties
zenaudit.xml
zenaudit_dmaccounts.properties
```

Ensure that these files have appropriate rights. The files are located in the following path:

- ♦ **Windows:** `ZENworks_installation_path\conf\datamodel`
- ♦ **Linux:** `/etc/opt/novell/zenworks/datamodel`

Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

- 2 Start all the ZENworks services on all the ZENworks Servers in the Management Zone.

- ♦ **On Windows:**

1. Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```

2. Enter the number next to the `Stop` action.

- ♦ **On Linux:**

1. Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

2. Enter the number next to the `Stop` action.

The ZENworks Server now points to the new database.

For the Oracle 11g database, any administrator name is case sensitive, including login names from user sources. The default ZENworks administrator account automatically created during installation uses an initial capital, so in order to log into ZENworks Control Center, you must enter `Administrator`.

If your zone has ZENworks Reporting, then you must run the ZENworks Reporting Configuration Tool to point to the newly migrated Oracle database.

12 Configuring the ZENworks Server to Point to the New MS SQL Database Containing Data Moved from Another MS SQL Database

If you move the data from one MS SQL database to another MS SQL database, the Windows or Linux ZENworks Server must be configured to point to the new MS SQL database.

The following sections provide detailed information:

- ♦ [“Preparing to Move the Data” on page 55](#)
- ♦ [“Configuring the ZENworks Server to Point to the New MS SQL Database” on page 56](#)

Preparing to Move the Data

Before configuring the server to point the new MS SQL database, do the following:

- ♦ Run the ZENworks Diagnostic Center (ZDC) and check for schema differences.

If the ZENworks database tables are not present under the default database schema DBO, then to avoid any issues, contact Micro Focus Customer Center before upgrading your zone.

To find out the database scheme, run the following query in the Microsoft SQL database:

```
SELECT distinct(SCHEMA_NAME(schema_id)) as OWNER FROM sys.objects WHERE type='U'
```

- ♦ Ensure that the ZENworks Server is configured to an MS SQL database. Assume that the device that currently host the MS SQL database is called MSDB1.
- ♦ Ensure that you have another Windows device with an MS SQL database installed. Assume that this device is called MSDB2. For more information on how to install an MS SQL database, for Windows, see [“Installing and Configuring an External ZENworks Database”](#) for Linux, see [“Installing and Configuring an External ZENworks Database”](#) in the *ZENworks Server Installation*.
- ♦ Stop all the ZENworks services on all the ZENworks Servers in the Management Zone.
 - ♦ **On Windows:**
 1. Execute the following command at the server prompt:
`novell-zenworks-configure -c Start`
 2. Enter the number next to the Stop action.
 - ♦ **On Linux:**
 1. Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```

2. Enter the number next to the Stop action.

- ♦ Move the data from MSDB1 to MSDB2. For more information about moving the data, see the MS SQL database documentation.

Configuring the ZENworks Server to Point to the New MS SQL Database

To configure the ZENworks Server to point to the new database (MSDB2), perform the following tasks on the ZENworks Server:

- 1 Take back up, and edit the `zdm.xml` and `zenaudit.xml` files (located in `ZENworks_installation_path\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux) to do the following:
 - ♦ Ensure that the value of the `Port` entry key is the port number on which the MS SQL database is running.
 - ♦ Set the value of the `Server` entry key to the IP address of the MSDB2 device.
 - ♦ Set the value of the `Database` entry key to path of the database directory of the MSDB2 device.
 - ♦ If user name or password of the database is changed, then you must change the user name and password in the following locations:
 1. `dmaccounts.properties` and `zenaudit_dmaccounts.properties` files. (located in `ZENworks_installation_path\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux). It is recommended that do not use the SA user for ZENworks database access.

```
username=password
```

The password will be encrypted automatically when you restart the ZENworks services.
 2. `dmmappings.properties` located in `/etc/opt/novell/zenworks/datamodel` on Linux and `ZENworks_installation_path\conf\datamodel` on Windows.

If you have changed the ZEN user name, then update `readonly` and `superuser` fields. If you have changed audit user, then change the `audit` field.
- 2 Restart the ZENworks services.
 - ♦ **On Windows:**
 1. From the Windows desktop **Start** menu, click **Settings > Control Panel**.
 2. Double-click **Administrative Tools > Services**.
 3. Start the following services: **Novell ZENworks Server**, **Novell ZENworks services Monitor**, and **Novell ZENworks Agent Service**.
 - ♦ **On Linux:** At the console prompt, enter the following commands:
 - ♦

```
/etc/init.d/novell-zenmntr restart
```
 - ♦

```
/etc/init.d/novell-zenserver restart
```
 - ♦

```
/etc/init.d/novell-zenloader restart
```


- 3 Start the ZENworks services on all other ZENworks Servers in the Management Zone.

On Windows:

1. Execute the following command at the server prompt:
`novell-zenworks-configure -c Start`
2. Enter the number next to the Start action.

On Linux:

1. Execute the following command at the server prompt:
`/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
2. Enter the number next to the Start action.

13 Configuring the ZENworks Server to Point to the New Oracle Database Containing Data Moved from Another Oracle Database

If you move the data from one Oracle database to another Oracle database, the Windows or Linux ZENworks Server must be configured to point to the new Oracle database.

The following sections provide detailed information:

- ♦ [“Preparing to Move the Data” on page 59](#)
- ♦ [“Configuring the ZENworks Server to Point to the New Oracle Database” on page 60](#)

Preparing to Move the Data

Before configuring the server to point the new Oracle database, do the following:

- ♦ Ensure that the ZENworks Server is configured to an Oracle database. The database can be installed on the ZENworks Server or on a different device. Assume that the device that currently host the Oracle database is called ORDB1.
- ♦ Ensure that you have another Windows device with an Oracle database installed with the same database credentials as the ORDB1. Assume that this device is called ORDB2. For more information on how to install an Oracle database, for Windows, see [“Installing and Configuring an External ZENworks Database”](#) for Linux, see [“Installing and Configuring an External ZENworks Database”](#) in the *ZENworks Server Installation*.
- ♦ Move the data from ORDB1 to ORDB2. For more information about moving the data, see the Oracle database documentation.
- ♦ Stop the ZENworks services on the ZENworks Servers in the Management Zone.
 - ♦ **On Windows:**
 1. Execute the following command at the server prompt:
`novell-zenworks-configure -c Start`
 2. Enter the number next to the Stop action.
 - ♦ **On Linux:**
 1. Execute the following command at the server prompt:
`/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
 2. Enter the number next to the Stop action.

Configuring the ZENworks Server to Point to the New Oracle Database

To configure the ZENworks Primary Server to point to the new Oracle database (ORDB2), perform the following tasks on the ZENworks Primary Server:

- 1 Take back up, and edit the `zdm.xml` and `zenaudit.xml` files (located in `ZENworks_installation_path\conf\datamodel` on Windows and in `/etc/opt/novell/zenworks/datamodel` on Linux) to do the following:
 - ♦ Ensure that the value of the `Port` entry key is the port number on which the Oracle database is running.
 - ♦ Set the value of the `Server` entry key to the IP address of the ORDB2 device.
 - ♦ Set the value of the `Database` entry key to net service name of the Oracle database installed on the ORDB2 device.
- 2 Start the ZENworks services on all the ZENworks Servers in the Management Zone.
 - ♦ **On Windows:**
 1. Execute the following command at the server prompt:
`novell-zenworks-configure -c Start`
 2. Enter the number next to the `Stop` action.
 - ♦ **On Linux:**
 1. Execute the following command at the server prompt:
`/opt/novell/zenworks/bin/novell-zenworks-configure -c Start`
 2. Enter the number next to the `Stop` action.

ZENworks Server should now point to the new database.

14 Configuring PostgreSQL

Each Primary Server on PostgreSQL can consume up to 300 database connections. If you want to add more than one Primary Server, you should change the property values in the `postgresql.conf` file.

For the external database, the `postgresql.conf` file is available at the following location:

- ♦ **On Windows:** `<install_directory>\PostgreSQL\<version>\data`
- ♦ **On Linux:** `/var/lib/pgsql/<version>/data`

Use the following formula to calculate the property values.

`max_connections` = Number of primary servers * 300

`max_prepared_transactions` = Number of primary servers * 300

After changing the property values in `postgresql.conf`, restart the ZENworks and PostgreSQL service.

To start the PostgreSQL service:

- ♦ **On Windows:** To start the service, perform the following:
 1. Press Windows + R keys.
 2. Type `services.msc`.
 3. Search for the PostgreSQL service based on the installed version.
 4. Click Start the service.
- ♦ **On Linux:** To start the service, run the `systemctl start postgresql.service` command.

For more information, see [PostgreSQL Tuning and Maintenance](#) in the [ZENworks Configuration Management - Best Practices Guide](#).

15 Creating External PostgreSQL Database Schema

To create external or Remote OEM PostgreSQL schema, perform the following:

- 1 Insert or mount the ZENworks 2017 installation ISO on the server where you want to install the Remote OEM or External PostgreSQL database.
- 2 Open the command prompt and run the following command:
 1. **On Windows:** `setup.exe -c`
 2. **On Linux:** `setup.sh -c`
- 3 In the Select the database to be configured page, select ZENworks Database, Audit Database or both, and then click Next.
- 4 In the Select Database type page, select Remote OEM or External PostgreSQL database.
- 5 Specify the following for both the ZENworks and Audit databases:
 - ♦ Server Name
 - ♦ Port Number
 - ♦ Database Name
 - ♦ User Name
 - ♦ Password

16 Migrating the Data from an External Sybase Database to an External PostgreSQL Database

ZENworks 2020 onwards, the Sybase database will no longer be supported, and the Sybase data will have to be migrated to any ZENworks supported database. Using the new Database Migration tool, you can migrate the Sybase database to the PostgreSQL database. For more information, see [Database Migration from Sybase to PostgreSQL](#).

The migration tool can be downloaded from the ZENworks 2020 downloads in the Micro Focus Customer Center.

NOTE: Ensure that you download the latest version of the database migration tool.

17 Migrating the Data from an Oracle Database to an MS SQL Database

ZENworks allows you migrate the data from an Oracle database to an MS SQL database installed on a device that does not have ZENworks installed.

Review the following to migrate the database:

- ♦ [“Preparing to Move the Data” on page 67](#)
- ♦ [“Migrating the Data from the Oracle Database to an MS SQL Database” on page 68](#)

Preparing to Move the Data

Before migrating the data from the Oracle database to the MS SQL database, do the following:

- ♦ Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- ♦ Ensure that the Primary Server to which the Oracle database is configured has been upgraded to the latest version of ZENworks.
- ♦ Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- ♦ (Conditional) If you want to create a new database on MS SQL Server, and migrate the Oracle data into the new database, you must be aware of the database administrator credentials.
- ♦ (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the db_owner database role and you must procure the database credentials of the newly created user from the database administrator.
- ♦ Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone. Run `novell-zenworks-configure -c Stop` and choose the ZENworks services to stop.
- ♦ Ensure that the Oracle database that is hosting the ZENworks and Audit databases are running.
- ♦ (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:

1. Set the value of `Logger.logLevel` to the appropriate message type.

For example, if you want messages of the type Finest to be logged:

```
#Logger.logLevel = FINEST
```

2. Uncomment the line by removing the “#” as follows:

```
Logger.logLevel    = FINEST
```

The `novell-zenworks-configure.properties` file is located in
`%ZENWORKS_HOME%\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Oracle Database to an MS SQL Database

- ♦ [“Preparing to Move the Data” on page 68](#)
- ♦ [“Migrating the Data from the Oracle Database to an MS SQL Database” on page 69](#)
- ♦ [“Resuming the Database Migration” on page 70](#)
- ♦ [“Post-Migration Tasks” on page 71](#)

Preparing to Move the Data

Before migrating the data from the database to the MS SQL database, do the following:

- ♦ Ensure that the license state of ZENworks is Active. The product must be installed and running either in the licensed version or the evaluation version.
- ♦ Ensure that the MS SQL database is installed on a device that does not have ZENworks installed.
- ♦ (Conditional) If you want to create a new database on MS SQL Server, and migrate the Sybase data into the new database, you must be aware of the database administrator credentials.
- ♦ (Conditional) If you want to migrate the data to an existing database that resides on the MS SQL server in your network, the newly created user must be assigned the `db_owner` database role and you must procure the database credentials of the newly created user from the database administrator.
- ♦ Ensure that you perform a dry run for the clone Oracle database and SQL database to be familiar with the process or configure action steps or inputs to avoid failure cases in production, detect any database specific issues in advance, and also estimate the total migration time.
- ♦ Validate connectivity to MS SQL database, user credentials, and user mapping and any necessary rights to successfully create the schema.
- ♦ Manually stop the ZENworks services running on all other ZENworks Servers in the Management Zone.
 - ♦ **On Windows:**
 1. Execute the following command at the server prompt:

```
novell-zenworks-configure -c Start
```
 2. Enter the number next to the `Stop` action.
 - ♦ **On Linux:**
 1. Execute the following command at the server prompt:

```
/opt/novell/zenworks/bin/novell-zenworks-configure -c Start
```
 2. Enter the number next to the `Stop` action.

- ♦ (Optional) The status of database migration is logged into the `novell-zenworks-configure.log` file. By default, only the messages of the type Info and Severe are logged. If you want other message types (such as Finer, Finest, and Warning) to also be logged into the file, do the following in the `novell-zenworks-configure.properties` file:

1. Set the value of `Logger.logLevel` to the appropriate message type.

For example, if you want messages of the type Finest to be logged:

```
#Logger.logLevel    = FINEST
```

2. Uncomment the line by removing the “#” as follows:

```
Logger.logLevel    = FINEST
```

The `novell-zenworks-configure.properties` file is located in

`%ZENWORKS_HOME%\conf\` on Windows and in `/etc/opt/novell/zenworks/` on Linux.

Migrating the Data from the Oracle Database to an MS SQL Database

NOTE: For Linux Primary Server or Appliance ensure that you are running the migration directly on the Primary Server console and not via SSH clients to prevent any connection or timeout.

- 1 Ensure that all the tasks listed in [“Preparing to Move the Data” on page 68](#) are completed.
- 2 Run the `novell-zenworks-configure -c migration_new.DBMigration` database migration utility.
- 3 Select the target database type as `sql-server`.
- 4 Choose the purging option for data before database migration.
- 5 Enter the IP address or host name of the MS SQL database server.
- 6 Enter the port used by the MS SQL database server.
- 7 (Optional) Enter the named instance for the MS SQL Server engine.
- 8 Choose to create a new database or use an existing database that resides on the MS SQL server.
If you choose to create a new database, continue with [Step 9](#).
If you choose to use an existing database, skip to [Step 10](#).
- 9 (Conditional) If you choose to create a new database in [Step 8](#), perform the following tasks:
 - 9a Select the authentication type (Windows or SQL Server) to be used for the database administrator user.
 - 9b Enter the database server administrator user name.
 - 9c Enter the database server administrator password.
 - 9d (Conditional) If you choose Windows authentication in [Step 9a](#), enter the database administrator’s domain name.
- 10 Select the authentication type (Windows or SQL Server) to be used for the database access user.
- 11 Enter the database access user name.
- 12 Enter the database access user password.

- 13 (Conditional) If you choose Windows authentication in [Step 10](#), enter the database access user's domain name.
- 14 Enter the database name of the database that resides on the MS SQL server to which you want to migrate the data. If you choose to create a new database in [Step 8](#), the database is created on the MS SQL server with the name that you specify in this step.
- 15 (Conditional) If you choose to create a new database in [Step 8](#), enter the complete path where you want the database to be created.
- 16 Perform the steps from [Step 5](#) to [Step 15](#) for ZENworks audit database. The database migration starts.
- 17 When the database migration is complete, you can verify the `novell-zenworks-configure.log` file to see if the migration was successful. The log file is located in `%ZENWORKS_HOME%\log\` on the Windows Primary Server and in `/var/opt/novell/log/zenworks/` on the Linux Primary Server.
- 18 After the database is successfully migrated, continue with the following steps:
 - 18a Perform post-migration tasks. See [“Resuming the Database Migration” on page 70](#).
 - 18b Re-configure the ZENworks Reporting Server to point to the MS SQL database, because it will still be pointing to the Oracle database.

Resuming the Database Migration

If the migration of the database is stopped for any reason, the ZENworks migration utility allows you to resume the migration if the **DBMigration.xml** and **AuditDBMigration.xml** files for ZENworks and Audit databases has been created. The file is located in the `%ZENWORKS_HOME%\bin` directory on the Windows Primary Server, and in the `/opt/novell/zenworks/bin` directory on the Linux Primary Server.

- 1 Run the database migration utility.
 - ♦ **On the Windows Primary Server:** At the command prompt, go to `ZENworks_installation_path\bin\`, then enter the following command:
`novell-zenworks-configure.bat -c migration_new.DBMigration`
 - ♦ **On the Linux Primary Server:** At the console prompt, go to `/opt/novell/zenworks/bin`, then enter the following command:
`novell-zenworks-configure -c migration_new.DBMigration`
- 2 Enter the target database type as SQL database server.
- 3 Enter the IP address or host name of the MS SQL database server.
 You must specify the IP address or host name of the MS SQL database server used while migrating the database. For example, if you had specified the IP address of the database server while migrating the database, then you must specify the same IP address while resuming the database migration. You cannot specify the host name of the database server.
- 4 (Optional) Enter the named instance of the MS SQL Server engine.
- 5 Choose to use an existing database.
- 6 Enter the credentials of the database user depending on the authentication mode selected.
- 7 Enter the database name.
- 8 Perform from [Step 1](#) to [Step 7](#) for audit database migration.

- 9 Choose to resume the database migration.

The database migration starts.

- 10 After the database is successfully migrated, continue with [“Post-Migration Tasks” on page 71](#).

Post-Migration Tasks

If there is only one server in the Management Zone, all ZENworks services are automatically started after the data is successfully migrated to an MS SQL Server database.

If there are multiple servers in the Management Zone:

- 1 On the device where you ran the migration utility, copy the following files to the appropriate directory on all the servers:

```
zdm.xml
dmaccounts.properties
dmmappings.properties
zenaudit.xml
zenaudit_dmaccounts.properties
```

The files are located in the `%ZENWORKS_HOME%\conf\datamodel` directory on Windows and in the `/etc/opt/novell/zenworks/datamodel` directory on Linux.

Ensure that you run `permissions.sh` script located at `/opt/novell/zenworks/bin` on the Linux server after copying the above listed files.

- 2 Start all the ZENworks services on all the ZENworks Servers in the Management Zone.

The ZENworks Server now points to the new database.

Check the Diagnostics page in ZCC to ensure all servers are able to connect to the new MS SQL database.

- 3 Run ZDC on the Primary Server to validate the schema.

For more information, see [ZENworks Diagnostic Center](#).

- 4 Configure the READ committed snapshot setting for ZENworks database.

For more information, see [Prerequisites for Microsoft SQL Server](#) in the [ZENworks Server Installation](#).

18 Backing Up and Restoring the PostgreSQL Database

For more information on Back-up and restore of the PostgreSQL database, see [“Backing Up and Restoring the PostgreSQL Database” on page 41](#).

19 Migrating from md5 to scram authentication in PostgreSQL

From PostgreSQL 13 onwards, the default password encryption is changed from "md5" to "scram-sha-256". This document provides the complete information on how to migrate from md5 to scram authentication.

To avoid any connection issues with password encryption, ensure that you perform one of the following processes:

MD5

The method md5 uses a custom and less secure challenge-response mechanism. It prevents password sniffing, and storing passwords on the server in plain text, but it provides no protection if an attacker manages to steal the password hash from the server, the MD5 hash algorithm is nowadays no longer considered secure against determined attacks.

To continue using the md5 encryption, change the method in `pg_hba.conf` file for all entries to md5 and restart the PostgreSQL database server services.

SCRAM-SHA-256

The method scram-sha-256 performs SCRAM-SHA-256 authentication, as described in RFC 7677. It is a challenge-response scheme that prevents password sniffing on untrusted connections and supports storing passwords on the server in a cryptographically hashed form which is thought to acquire.

- ♦ By default, the freshly installed PostgreSQL user scram-sha=256 authentication. Hence, no modifications are required.
- ♦ If you are migrating the database to PostgreSQL 13.x from an older version, then perform the following:

NOTE: Ensure that you upgrade the ZENworks Management Zone after performing the following steps.

1. Modify the method in `pg_hba.conf` file for all entries to md5.
2. Modify the "password_encryption" parameter in `postgresql.conf` file to "md5".
3. Restart the PostgreSQL database services.
4. Migrate old data (OR) restore old data from backup, along with the users which are encrypted in "md5".

5. Connect the PostgreSQL using from psql/sql-client with super user (postgres/zenpostgres user) and run the following commands:
 - a. `alter system set password_encryption = 'scram-sha-256';`
 - b. `select pg_reload_conf();`
 - c. run below command for all database users including superuser/zenworks/audit, etc..
`ALTER USER <<user_name>> WITH PASSWORD '<<existing (or) new password>>';`
 - d. To verify if the password is encrypted to scram-sha-256 run the below query.
`select username,passwd from pg_shadow;`
 - e. Exit
6. Modify the method in pg_hba.conf file for all entries to scram-sha-256.
7. Restart the PostgreSQL database services.



Database Management - Best Practices, Tips, Troubleshooting

This section includes some tips and best practices for database management:

- ♦ [Chapter 20, “Database Ports,” on page 79](#)
- ♦ [Chapter 21, “Database Tips,” on page 81](#)
- ♦ [Chapter 22, “Troubleshooting Database Migration,” on page 87](#)

20 Database Ports

Following are the default ZENworks database ports:

Port Number	Description
1433	Default port to connect with the MS SQL database. Based on your configuration, the port number might vary.
1521	Default port to connect with the Oracle database. Based on your configuration, the port number might vary.
54327	Default port to connect with the Embedded and Remote OEM PostgreSQL database.

21 Database Tips

- ♦ [“Changing the ZENworks Database User Password” on page 81](#)
- ♦ [“Maximum Pool Size” on page 82](#)
- ♦ [“Verifying Invalid Objects and Indexes in the Oracle Database” on page 82](#)

Changing the ZENworks Database User Password

Use system administrator or user with DBA privileges to execute the below commands.

Before changing the password ensure that you shutdown all Primary Servers and Reporting Server.

- ♦ **For SQL Anywhere or Oracle:** After you log into SQL Anywhere or Oracle database run the below SQL statement to change the password for existing user.

```
ALTER USER <<username>> IDENTIFIED BY <<new password>>
```

- ♦ **For Microsoft SQL Server:** Users with SQL Server authentication, might run the below SQL statement to change the password for existing user.

```
ALTER LOGIN <<username>> WITH PASSWORD = 'new password' OLD_PASSWORD = 'old password'
```

User with Windows authentication, might change the Windows user account password and no changes required in SQL Server.

After changing the database user password, perform the following steps to change the password in all the Primary Servers:

- 1 Go to the following path;
 - ♦ **On Windows:** C:\Program Files (x86)\Novell\ZENworks\conf\datamodel
 - ♦ **On Linux:** /etc/opt/novell/zenworks/datamodel
- 2 Back up the dmaccounts.properties and zenaudit_dmaccounts.properties files.
- 3 Open the dmaccounts.properties and zenaudit_dmaccounts.properties files.
- 4 Change the existing password that is in encrypted form.

For example, the existing value is ZENWORKS=@OB@6a7278626bba

and the changed value is ZENWORKS=<<new password>>

IMPORTANT: Do not encrypt the new password. The new password is encrypted automatically when you restart the ZENworks services.

Maximum Pool Size

The MaxPoolSize value configured in the `zdm.xml` file governs the maximum number of connections allowed in a database connection pool from a Primary Server.

The `zdm.xml` file is located on the Primary Server:

Windows: `%ZENWORKS_HOME%\conf\datamodel\`

Linux: `/etc/opt/novell/zenworks/datamodel/`

With the default MaxPoolSize value of 100, the ZENServer and ZENLoader services currently create a single thread pool. As a result, under the peak load, there are 100 possible connections each from ZENloader and ZENserver.

However, the database server should be able to accept and serve $200 * \langle N \rangle$ concurrent connections from the ZENworks context, where N is the number of Primary Servers in the ZENworks Zone.

The current default value is sufficient for most configurations and loads. It is recommended not to customize the MaxPoolSize value; to closely monitor the database, functionality and performance of ZENworks.

If you want to configure a higher value for the MaxPoolSize parameter, ensure that the number of concurrent connections that can be accepted or served by the database server is greater than or equal to $2 * \langle \text{Configured MaxPoolSize} \rangle * \langle \text{Number of Primary Servers} \rangle$.

NOTE: The default MinPoolSize value is 5.

Verifying Invalid Objects and Indexes in the Oracle Database

If you encounter Invalid Objects or Invalid Index in ZENworks Control Center or ZENworks logs, you can use the following queries to verify if there are any Invalid objects and Indexes in the Oracle database

NOTE

- ♦ Do NOT use SQuirreL
-

```
SELECT * FROM USER_OBJECTS WHERE STATUS != 'VALID' ;
SELECT * FROM USER_INDEXES WHERE FUNCIDX_STATUS = 'DISABLED' ;
SELECT * FROM USER_INDEXES WHERE STATUS NOT IN ('VALID', 'USABLE', 'N/A') ;
SELECT * FROM USER_IND_PARTITIONS WHERE STATUS NOT IN ('N/A', 'USABLE') ;
SELECT * FROM USER_IND_SUBPARTITIONS WHERE STATUS NOT IN ('USABLE') ;
SELECT * FROM USER_CONSTRAINTS WHERE STATUS != 'ENABLED' ;
```

The above queries should NOT return any records.

If these queries return any records, then you need to run the below scripts in the respective schema:

```

DECLARE
    V_CNT NUMBER;
BEGIN
    SELECT COUNT(1)
    INTO V_CNT
    FROM USER_OBJECTS
    WHERE STATUS      = 'INVALID'
    AND OBJECT_TYPE IN ( 'PROCEDURE', 'TRIGGER', 'FUNCTION', 'VIEW' );
    WHILE V_CNT      > 0
    LOOP
        FOR REC IN
            (SELECT *
            FROM USER_OBJECTS
            WHERE STATUS      = 'INVALID'
            AND OBJECT_TYPE IN ( 'PROCEDURE', 'TRIGGER', 'FUNCTION', 'VIEW' )
            )
        LOOP
            BEGIN
                EXECUTE IMMEDIATE 'ALTER ' || REC.OBJECT_TYPE || '
' || REC.OBJECT_NAME || ' " COMPILE';
            EXCEPTION
                WHEN OTHERS THEN
                    NULL;
            END;
        END LOOP;
        SELECT COUNT(1)
        INTO V_CNT
        FROM USER_OBJECTS
        WHERE STATUS      = 'INVALID'
        AND OBJECT_TYPE IN ( 'PROCEDURE', 'TRIGGER', 'FUNCTION', 'VIEW' );
    END LOOP;
END;
/

```

```

DECLARE
    V_CNT NUMBER;
BEGIN
    SELECT COUNT(1)
    INTO V_CNT
    FROM USER_INDEXES
    WHERE FUNCIDX_STATUS= 'DISABLED'
    AND TEMPORARY      = 'N'
    AND INDEX_TYPE!    = 'LOB'
    AND PARTITIONED    = 'NO'
    AND TABLE_NAME    IN
        (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY= 'N'
        )
    AND TABLE_NAME NOT IN ( 'PLAN_TABLE', 'ZENUPGRADELOG', 'ZENUPG_INDEX' );
    WHILE V_CNT      > 0
    LOOP
        FOR REC IN
            (SELECT *
            FROM USER_INDEXES
            WHERE FUNCIDX_STATUS= 'DISABLED'

```

```

AND TEMPORARY          = 'N'
AND INDEX_TYPE!        = 'LOB'
AND PARTITIONED        = 'NO'
AND TABLE_NAME        IN
    (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N'
    )
AND TABLE_NAME NOT IN ( 'PLAN_TABLE', 'ZENUPGRADELOG', 'ZENUPG_INDEX' )
)
LOOP
    EXECUTE IMMEDIATE 'ALTER INDEX ' || REC.INDEX_NAME || ' ENABLE';
END LOOP;
SELECT COUNT(1)
INTO V_CNT
FROM USER_INDEXES
WHERE FUNCIDX_STATUS='DISABLED'
AND TEMPORARY          = 'N'
AND INDEX_TYPE!        = 'LOB'
AND PARTITIONED        = 'NO'
AND TABLE_NAME        IN
    (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N'
    )
AND TABLE_NAME NOT IN ( 'PLAN_TABLE', 'ZENUPGRADELOG', 'ZENUPG_INDEX' );
END LOOP;
END;
/

BEGIN
FOR REC1 IN
    (SELECT *
    FROM USER_INDEXES
    WHERE PARTITIONED='YES'
    AND TABLE_NAME IN
        (SELECT TABLE_NAME FROM USER_TABLES WHERE TEMPORARY='N'
        )
    AND TABLE_NAME NOT IN ( 'PLAN_TABLE', 'ZENUPGRADELOG', 'ZENUPG_INDEX' )
    )
LOOP
    IF REC1.STATUS='N/A' THEN
        FOR REC2 IN
            (SELECT *
            FROM USER_IND_PARTITIONS
            WHERE INDEX_NAME=REC1.INDEX_NAME
            AND STATUS!      = 'USABLE '
            )
        LOOP
            IF REC1.STATUS='N/A' THEN
                FOR REC3 IN
                    (SELECT *
                    FROM USER_IND_SUBPARTITIONS
                    WHERE INDEX_NAME =REC2.INDEX_NAME
                    AND PARTITION_NAME=REC2.PARTITION_NAME
                    AND STATUS!      = 'USABLE '
                    )
                LOOP
                    EXECUTE IMMEDIATE 'ALTER INDEX ' || REC3.INDEX_NAME || ' REBUILD

```

```

SUBPARTITION '||REC3.SUBPARTITION_NAME;
    END LOOP;
ELSE
    EXECUTE IMMEDIATE 'ALTER INDEX '||REC2.INDEX_NAME||' REBUILD
PARTITION '||REC2.PARTITION_NAME;
    END IF;
END LOOP;
END IF;
END LOOP;
FOR REC IN
(SELECT * FROM USER_INDEXES WHERE FUNCIDX_STATUS!='ENABLED'
)
LOOP
    EXECUTE IMMEDIATE 'ALTER INDEX '||REC.INDEX_NAME||' ENABLE';
END LOOP;
END;
/

```

Verify the invalid objects after executing above scripts. The following queries should NOT return any records:

```

SELECT * FROM USER_OBJECTS WHERE STATUS='INVALID';
SELECT * FROM USER_INDEXES WHERE FUNCIDX_STATUS='DISABLED';
SELECT * FROM USER_INDEXES WHERE STATUS='INVALID';
SELECT * FROM USER_IND_PARTITIONS WHERE STATUS NOT IN ('N/A','USABLE');
SELECT * FROM USER_IND_SUBPARTITIONS WHERE STATUS NOT IN ('USABLE');
SELECT * FROM USER_CONSTRAINTS WHERE STATUS!='ENABLED';

```


22 Troubleshooting Database Migration

- ♦ [“After database migration ZEUS is unable to contact the new database server” on page 87](#)
- ♦ [“During Appliance deployment, configuring External PostgreSQL using the New Schema option fails to create Audit database” on page 88](#)
- ♦ [“Troubleshooting a Java Heap Space Exception” on page 88](#)
- ♦ [“Troubleshooting an Oracle Database Crash” on page 89](#)
- ♦ [“Troubleshooting an Oracle Tablespace Issue” on page 89](#)
- ♦ [“Troubleshooting the Database Migration Failure Issue” on page 89](#)
- ♦ [“Troubleshooting the Database Migration by Using An Existing User Schema” on page 90](#)
- ♦ [“Troubleshooting the ORA-01652: unable to extend temp segment by 128 in tablespace TEMP” on page 90](#)
- ♦ [“Troubleshooting the ORA-01400: cannot insert NULL” on page 91](#)
- ♦ [“Troubleshooting the ORA-12516, TNS: listener could not find available handler with matching protocol stack” on page 91](#)
- ♦ [“Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table” on page 91](#)

After database migration ZEUS is unable to contact the new database server

If you have added the database.conf file to override the default JDBC URL and drivers values. After database migration, the content of the database.conf file might not be updated with the latest database information. Hence, ZEUS might not be able to contact the new database server.

Workaround:

By default, the details in the ZDM.xml file is used to communicate between database server and ZEUS. If you want to override the default JDBC driver class and JDBC URL values, then updated the database.conf file with the new database information.

To use the default values for driver class and JDBC URL, delete the database.conf, else value in this file will be used to communicate with ZEUS.

The database.conf file is available in the following location:

On Windows: %ZEN_HOME%\ZeUS\conf\

On Linux: /etc/opt/novell/zenworks/ZeUS/conf/

During Appliance deployment, configuring External PostgreSQL using the New Schema option fails to create Audit database

While deploying the ZENworks 2017 Appliance, if you configure external PostgreSQL as the database (ZENworks and Audit) using the New Schema option, then the Audit database might not be created.

Workaround: Create a PostgreSQL database schema and then deploy the appliance. During the appliance deployment, configure the external PostgreSQL database using the Existing Schema option.

For more information on creating PostgreSQL schema, see the [“Creating External PostgreSQL Database Schema” on page 63](#) section.

Troubleshooting a Java Heap Space Exception

If you encounter a Java heap space exception during the database migration because of low memory:

- 1 Edit the `ZENworks_installation_path\bin\novell-zenworks-configure.bat` file on Windows or `/opt/novell/zenworks/bin/novell-zenworks-configure` on Linux to change the heap space value in the following line, depending upon the RAM of the device where the migration utility is running:

```
%JAVA_HOME%\bin\java" -Djava.library.path=%ZENLIB% -cp "%MYCP%"
%DEBUG_OPTS% %JAVA_OPTS% -Xmx1024m
com.novell.zenworks.configure.ConfigureLoader %CONFIG_OPTS%
```

The heap space value is represented in megabytes (MB) within `-Xmx1024m`. By default, it is 1024.

For example, if the RAM of the device is 2048 MB, then the line in the `novell-zenworks-configure.bat` file can be updated as follows:

```
%JAVA_HOME%\bin\java" -Djava.library.path=%ZENLIB% -cp "%MYCP%"
%DEBUG_OPTS% %JAVA_OPTS% -Xmx2048m
com.novell.zenworks.configure.ConfigureLoader %CONFIG_OPTS%
```

IMPORTANT: The heap space value must be either equivalent to or less than the RAM of the device. It is recommended to have a minimum 2048 MB to continue with database migration.

- 2 At the console prompt, run the `ZENworks_installation_path\bin\novell-zenworks-configure.bat` file on Windows or `/opt/novell/zenworks/bin/novell-zenworks-configure` on Linux.
- 3 Follow the prompts.

When you are prompted to enter the location of the file required for resuming the migration, enter the the complete path of `DBMigration.xml`. The file is located in the `ZENworks_installtion_path\bin` directory on Windows, and in the `/opt/novell/zenworks/bin` directory on Linux.

The XML file contains a list of tables and a flag indicating whether the table was successfully migrated or not. When the database migration resumes, only the tables with flag value set to False are migrated.

Troubleshooting an Oracle Database Crash

If the Oracle database crashes during the database migration:

- 1 At the console prompt, run the `ZENworks_installation_path\bin\novell-zenworks-configure.bat` file on Windows or `/opt/novell/zenworks/bin/novell-zenworks-configure` on Linux.
- 2 Follow the prompts.

When you are prompted to enter the location of the file required for resuming the migration, enter the complete path of `DBMigration.xml`. The file is located in the `ZENworks_installtion_path\bin` directory on Windows, and in the `/opt/novell/zenworks/bin` directory on Linux.

The XML file contains a list of tables and a flag indicating whether the table was successfully migrated or not. When the database migration resumes, only the tables with flag value set to False are migrated.

IMPORTANT: Do not edit the contents of `DBMigration.xml`.

Troubleshooting an Oracle Tablespace Issue

If the Oracle USERS tablespace does not have sufficient space to create and store the ZENworks database schema, the database migration fails with the following error messages while trying to create the tables:

```
SEVERE: Terminating the database migration.  
SEVERE: An error has occurred while migrating the database.
```

To resolve this issue, perform the following:

- ♦ The Oracle database administrator must increase the size of the USERS tablespace.
- ♦ Ensure that the tablespace has a minimum of 100 MB to create ZENworks database schema without any data in it.
- ♦ Ensure to have some extra space depending upon the size of the database to be migrated.

Troubleshooting the Database Migration Failure Issue

If the `NLS_CHARACTERSET` parameter is not set to `AL32UTF8` and the `NLS_NCHAR_CHARACTERSET` parameter is not set to `AL16UTF16`, the database migration fails with the following error messages:

```

Failed to run the sql script: localization-updater.sql,
message:Failed to execute the SQL command: insert into
zLocalizedMessage(messageid,lang,messagestr)
values('POLICYHANDLERS.EPE.INVALID_VALUE_FORMAT','fr','La stratÃ©gie {0}
n'a
pas pu Ãªtre appliquÃ©e du fait que la valeur de la variable "{1}" n'est
pas
dans un format valide. '),
message:ORA-00600: internal error code, arguments: [ktfbbsearch-7], [8],
[],
[], [], [], [], [], []

```

To resolve the issue of database migration failure:

- Set the NLS_CHARACTERSET parameter to AL32UTF8 and the NLS_NCHAR_CHARACTERSET parameter to AL16UTF16..
- Ensure that the character set parameters are configured with the recommended values, run the following query at the database prompt:

```

select parameter, value from nls_database_parameters where parameter
like '%CHARACTERSET%';

```

Troubleshooting the Database Migration by Using An Existing User Schema

If you choose to migrate the database by using an existing user schema, the database migration utility creates the ZENworks database but it might fail to migrate the data.

To resolve this issue:

- 1 Ensure that the ZENworks tables, views, and user sequence are deleted from the newly created ZENworks database by the database administrator. Later on, clear the `user_recyclebin` database table.
- 2 Start the database migration again by using the same user schema.

Troubleshooting the ORA-01652: unable to extend temp segment by 128 in tablespace TEMP

The **ORA-01652: unable to extend temp segment by 128 in tablespace TEMP** error appears, when the temp tablespace have default size and the current transaction involves more number of records with clob data type.

To troubleshoot this scenario, perform either of the following or both:

1. Add extra dbf file for temp tablespace.
2. Reduce the number of records for the transaction (For Database Migration if you are using default batch size 10,000 that can be reduced to 100 or 500 or 1000 based on the nature of each record having clob data.).

IMPORTANT: For better performance depending on the database size and resource availability, you can increase the batchsize in the `db-migration-mssql-to-oracle.properties` file. It is located in `%ZENWORKS_HOME%\novell\zenworks\conf\` on Windows and in `/etc/opt/novell/zenworks/conf/` on Linux.

Troubleshooting the ORA-01400: cannot insert NULL

The **cannot insert NULL** error appears, when you are migrating MS SQL to Oracle database.

To troubleshoot this scenario, perform the following:

1. Go to the `database-table-column-mapping.properties` file located at the following path:
 - ♦ **For Windows:** `%ZENWORKS_HOME%\Novell\ZENworks\conf`
 - ♦ **For Linux:** `/etc/opt/novell/zenworks/conf`
2. Open the `database-table-column-mapping.properties` file.
3. Append the Table name, Column, and the Replacement value according to the `database-table-column-mapping.properties` file format.

IMPORTANT: If you donot provide a replacement value, then it will take an empty character as a replacement value.

Troubleshooting the ORA-12516, TNS: listener could not find available handler with matching protocol stack

The **TNS: listener could not find available handler with matching protocol stack** error appears, when you are migrating MS SQL to Oracle database.

To troubleshoot this scenario, increase the oracle processes by using the below SQL statement and bounce the database to reflect the changes.

```
SQL> alter system set processes=500 scope=spfile
```

Troubleshooting the database migration failure, duplication of serial numbers in the zDevice table

In the ZENworks database on the Microsoft SQL server, if the unique constraint is not created on the serial number column of the `zDevice` table, duplicate serial numbers might be assigned to the devices that are connected to the Management Zone. Because of the duplicate serial numbers, the database migration from the Microsoft SQL database to the Oracle database might fail.

To identify and remove the duplicate serial number in the `zDevice` table, perform the following steps in the Microsoft SQL database:

1. Use the following query to identify the duplicate serial numbers in the Microsoft SQL database:

```
SELECT * FROM zDevice WHERE serialnumber IN (SELECT serialnumber FROM
zDevice GROUP BY serialnumber HAVING COUNT(1) > 1)
```

2. If the duplicate serial numbers are found on the zDevice table, do one of the following:
 - ♦ Remove the device from the Management Zone and register the device again.
 - ♦ Modify the duplicate serial numbers so that each serial number is unique.

To resume the database migration, perform the following in the Oracle database:

1. Use the following query to identify the duplicate serial numbers in the Oracle database:

```
SELECT * FROM zDevice WHERE serialnumber IN (SELECT serialnumber FROM
zDevice GROUP BY serialnumber HAVING COUNT(1) > 1)
```

2. Run the following SQL query to remove the duplicate entry from the target Oracle database:

```
begin
for rec in (select zuid from zDevice where serialnumber is null)
loop
update zDevice
set serialnumber=NVL(serialnumber,'_')||'_'||dbms_random.string('U',
10)
where zuid=rec.zuid;
commit;
end loop;

for rec in (select serialnumber from zDevice group by serialnumber
having count(1) > 1)
loop
update zDevice
set serialnumber=serialnumber||'_'||dbms_random.string('U', 10)
where serialnumber=rec.serialnumber;
commit;
end loop;
```

3. If there are any duplicate serial numbers, run the following query to verify.

If there are any duplicate numbers, run `select serialnumber from zDevice group by serialnumber having count(1) > 1;` and remove the duplicate serial numbers.

If there are no duplicates serial numbers, resume with the migration process.

NOTE: It is recommends that you clean up the duplicate serial numbers data before starting the database migration. You can continue to use the existing Management Zone without any loss functionality.
